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## CHAPTER 17 COMMENTS FROM THE HAWAII ENERGY STRATEGY 2000 WORKSHOP

### 17.1 The Hawaii Energy Strategy 2000 Workshop

On December 9, 1999, the Hawaii Energy Strategy 2000 Workshop was held in Honolulu to discuss the draft HES 2000 with interested citizens and to obtain their input. Advance registrants received a copy of *The HES 2000 Summary* as a preview. This was intended to assist participants in developing their input. An idea sheet was included with the summary to use to provide on improving Hawaii's energy future by mail if a person could not attend in person.

During the Workshop, brief overviews of the major sections of the Strategy were presented, followed by a discussion period. Participants provided the written comments below. They are provided here to provide additional perspectives on energy issues to Hawaii's decision-makers and others interested in energy matters.

General comments are organized alphabetically by author in section 17.2. Specific comments are organized in section 17.3, first by chapter, and then, by referenced paragraph, followed by general comments related to the chapter.

### 17.2 General Comments from Participants

#### 17.2.1 *Comments by Henry Curtis, Executive Director, Life of the Land*

**Indigenous Energy Sources.** The plan correctly points out that increasing the use of indigenous energy sources would be a better economic choice than our current "bleed" of our economy to purchase foreign fossil fuel. Exporting money from our economy only drains our local economy and provides for employment for workers in other countries. Hawaii needs to become more self-sufficient.

"Hawaii's economy is overdependent on oil . . . From Hawaii's perspective the system requires massive exports of money to pay for imports of crude oil . . . Hawaii's own renewable resources are not fully used". (Draft *HES 2000 Summary* Page 1)

"In addition, by investing in alternative energy sources within the state, expenses may not be reduce, but more of the money spent ill remain in the local economy and less oil use will reduce economic and environmental risks to Hawaii." (Draft *HES 2000 Summary* Page 2)

"Hawaii is far away from its sources of oil and remains dangerously dependent on oil for its energy needs."(Draft *HES 2000 Summary* Page 6)

Purchasing fossil fuels is bleeding Hawaii and accounts for a large portion of the net financial loss to the state each year (the imbalance in the balance of payments).

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**Renewable Energy Options.** At our recent Energy for the Millennium Conference, our keynote speaker, Dr. Donald Aitken, Senior Scientist for Renewable Energy with the Union of Concerned Scientists stated that Hawaii has almost every form of renewable energy available while most other states have just a couple of forms of renewable energy. Indeed, Hawaii has solar (solar water heating; photovoltaic cells), hydroelectric, wind, bagasse, landfill methane, refuse, and OTEC [ocean thermal energy conversion]. Why is Hawaii continuing to be so dependent on fossil fuel? Perhaps more importantly, why do we compare our rate of renewable energy with other states, when, in fact, we should compare what we do with the renewable resources we have to how other states do with the renewable energy resources they have.

At the same conference, Dr. Seiji Naya reported that the use of renewable energy had actually decreased. Auwe! We understood that the decline of the sugar industry has currently reduced the amount of biomass, but as Dr. Naya reported, “Hawaii has experience in almost every type of renewable energy, in one for or another.” Why then, are we not using our indigenous resources to provide a sustainable alternative to fossil fuel for Hawaii’s people?

A recommendation in Chapter 7 of the plan calls for “Continue diversification of fuels for electricity generation”. Substituting coal for oil while reducing the use of renewables shouldn’t be included in fuel diversification analysis. Instead, the recommendation should read: Implement renewable energy diversification.

**Global Warming.** The effects of global warming on Hawaii cannot be overstated. We understand that Hawaii is contributing 0.3 of 1% [of the U.S. contribution] to global warming, but raising the consciousness of the people of Hawaii is an important step in reducing our emissions. Prohibiting the construction of any more fossil fuel burning power generation plants. We therefore recommend that an effort be made to inform and educate the public on global warming issues.

None of the three scenarios reduced greenhouse gas emissions below the Kyoto target of less than 7% less than the 1990 levels. (Draft *HES 2000 Summary* Page 15) All scenarios assume that Hawaii can not meet the Kyoto Protocol.

Life of the Land strongly urges that at least one scenario be analyzed that meets the Kyoto target! [The final HES 2000 contains a scenario in Chapter 13 that reduces emissions below the Kyoto target.] Perhaps a second scenario should look at how we could exceed the Kyoto target and then profit from marketing the excess [emissions savings] to other utilities not blessed with our renewable options.

**Energy Efficiency.** “Energy is used relatively efficiently in Hawaii. In 1970, Hawaii’s per capita energy use was 86% of the national average, but by 1997, it was only 70% of the national average. Some of the reasons Hawaii is more efficient than the Mainland average include high energy prices that discourage energy use, little requirement for space heating, few energy-intensive industries, and short driving distances”. (Draft *HES 2000 Summary* Pages 3-4) Life of the

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Land wonders what our energy efficiency would be when the equations are normalized (cars: per mile efficiency; buildings: per degree heating and air conditioning efficiency).

**Competition.** “Implementing Competition in Hawaii . . . . Some are concerned that retail competition may leave individual residential customers behind”. (Draft *HES 2000 Summary* Pages 12-13) Others are concerned that the unusual and uniquely high price of energy in Hawaii has already negatively impacted our individual residential customers and small businesses. Still others worry that competition may lead to lower prices, more options, and reduced monopolistic income.

**Energy Preparedness.** On May 6-8, 1998, the State of Hawaii conducted a regional energy emergency seminar and simulation exercise . . . “. (Draft *HES 2000 Summary* Pages 14) “The [Hawaii Energy Council’s] EC’s primary responsibility will be to coordinate activities necessary to facilitate the affected energy utilities’ safe, rapid restoration of the commercial energy grid, and provide temporary emergency generators to safely and rapidly provide and sustain electricity for essential and emergency facilities and services until commercial energy utility service can be restored, an facilitate the availability and adequacy of fuel supplies, storage, and distribution”. (DBEDT ERT Webpage [<http://www.hawaii.gov/dbedt/>]) Distributed power would be nice. Let’s adopt it as a statewide policy!

**Competition.** A recommendation in Chapter 7 of the plan states, “Continue to examine electric competition for Hawaii. Suggested Lead Organizations: Public Utilities Commission and Parties to Docket”. Let’s not examine, let’s do something.

#### **17.2.2      *Comments by Dr. William H. Dorrance, Sc.D., Kailua***

The proposed report is an excellent summary of things that are already done or contemplated. However it lacks the bold strategy that is required to meet the energy crisis soon to come (in the decade 2010 to 2020). Specific suggestions for the time when it becomes obvious that gasoline is too precious to use as a transportation fuel:

1.      If LNG is to be imported, consider Kahoolawe as the location for unloading and storage tanks. The island is sufficiently isolated and the rental and employment could be a boon for Native Hawaiian. Consult a major gas distributor for what’s needed to import LNG.
2.      If a coal-to-gasoline converter is to be constructed using coal from Australia, put it on Kahoolawe. Visit South Africa to see how they do it.
3.      Keep Hawaii’s sugar farmers alive. Ethanol from cane will be cost-competitive sometime after 2010 but before 2020.
4.      Prepare now a curfew on street lighting. Perhaps a partial curfew according to section and time of darkness.

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5. Hydrogen stored under pressure within zeolites may become a transportation fuel.
  6. Public acceptance depends on public perception of a need. What's missing is the kind of projection of future petroleum costs, uses, and reserves similar to the computer calculations done by M.I.T. for the Club of Rome in 1970. It's folly to depend on projections from Washington. They are sure to be colored by a political attempt to "avoid alarming the voting public". Hawaii should do such calculations. It would keep Washington honest. No calculations are more important to Hawaii's future.
  7. Obviously, considerations of item 6 above must factor into plans for more highways and mass transit. I don't see that happening yet.

[Editor's Note: Dr. Dorrance also provided a paper on "Ethanol from Hawaii Cane" which analyzed Hawaii's sugar cane supply and potential production of ethanol from Hawaii cane. His analysis suggested that the costs would be relatively high, but given his expectation that crude oil supplies will decline, raising the price of gasoline above his projected sugar production cost after 2010. His conclusions were:]

1. Converting all Hawaii-produced raw sugar to ethanol would supply a substitute for less than 10% of the current consumption of gasoline.
2. However, because of the ever-growing world rate of consumption of petroleum, Hawaii-produced petroleum will become a cost-competitive substitute for gasoline in the decade from 2010 to 2020.
3. Converting Hawaii's sugar producers from raw sugar to ethanol substitutes a product for which there will be an ever-decreasing need for a product for which there are dependencies on uncertain, year-to-year, price supports.
4. This scenario depends on the uncertain knowledge of worldwide depletion of worldwide petroleum reserves. It is highly desirable that calculations be done to predict the depletion of petroleum reserves similar to those done at M.I.T. in 1968-1971.

[Editor's Note: In developing HES 1995, a DBEDT consultant produced a Transportation Energy Strategy (PBQD 1995). It contained a detailed analysis of the potential for ethanol production in Hawaii and estimated considerably lower costs than Dr. Dorrance, which could make ethanol production and use practical in the near term.]

### ***17.2.3 Comments of Jeff Mikulina, Director, Sierra Club, Hawaii Chapter***

[The following was based upon Mr. Mikulina's presentation at the Hawaii Energy Strategy 2000 Workshop, entitled "Visions of Hawaii's Energy Strategy".]

Weather Causes Record \$89 Billion Damage

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WASHINGTON (AP) - Violent weather has cost the world a record \$89 billion in 1998, more money than was lost from weather-related disasters in all of the 1980's, and researchers, in a study released blame human meddling for much of it. The report (by the Worldwatch Institute and Munich Re, the world's largest reinsurer) says a combination of deforestation and climate change has caused this year's most severe disasters.

Humans are altering the Earth's environment and completely altering the make up of our atmosphere. Developed nations are the leading source of greenhouse gas emissions. In Hawaii, we plan to follow a business-as-usual course when it comes to climate change, likely emitting 30% more CO<sub>2</sub> than the Kyoto goal (7% less than 1990 emissions, a compromise position of the Intergovernmental Panel on Climate Change, 1997). Yet climate change will intimately effect Hawaii--its people, ecosystems, and economy.

The goals of the Hawaii Energy Strategy are clear:

- Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;
- Increased energy self-sufficiency where the ratio of indigenous to imported energy is increased, and
- Greater energy security in the face of threats to Hawaii's energy supplies and systems.

But the Hawaii Energy Strategy 2000 (HES) fails to meet those goals: ·

- Does not reduce dependency on carbon-based fuels;
- Greatly increases carbon emissions;
- Subjects all of Hawaii's economy to the vagaries of world oil markets; and
- Misses opportunities to expand renewable energy markets in Hawaii

Climate change is already impacting Hawaii: ·

- Average temperature in Honolulu has increased 4.4 degrees F over the last century;
- Precipitation decreased 20% in same period · Droughts could lead to saltwater intrusion;
- Sea level is already rising 6-14 inches per century, likely to rise another 17-25 by 2100; and
- [There may be] Ecosystem disruptions, endangered species.

And the costs are, and will be, shocking: ·

- Eroding beaches and tourism;
- Cost of sand replenishment to protect coast from 20 inch rise:\$340 million to \$6 billion;

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- Violent storms (more Inikis);
  - Desalination of water
  - Loss of agriculture; and
  - Warmer temperatures

We can't predict exactly what climate change will bring, or how it will proceed, but its impacts on our environment will likely be greater than anything we've ever had to deal with. And once underway, scientists worry that feedback mechanisms, such as methane releases from melting tundra, will make catastrophic climatic shifts unstoppable.

Scientists worldwide agree: we must act now. A 1998, issue of the journal *Nature*, experts are urging for an all-out push for non-fossil energy. "The bottom line is that we are going to need an international effort pursued with the same urgency as the Manhattan Project or the Apollo space program. The roles of governments and market entrepreneurs in the eventual deployment of such technologies need to be considered more comprehensively than we have been able to do here. It is our hope that the potential adverse effects of humanity on Earth's climate will stimulate new industries in the 21st century, as did the Second World War and the Cold War in this century."

What does this mean for Hawaii? Hawaii needs to be a leader in its approach to energy. To meet this, the HES is challenged to clear a new energy future for Hawaii, and to use the Art of the Long View. Model all possible scenarios in a meaningful way, including the known and anticipated costs of climate change. Uses meaningful time horizons. Trend doesn't represent the future.

The HES must also be realistic. To ask marine and air transportation sectors to make dramatic cuts in emissions in the short term would be a challenge. Hawaii relies greatly on these sectors, and efficiency improvements won't likely be found in the near term. This means that ground transportation and electric utilities must take the greatest responsibility in decreasing Hawaii's greenhouse gas emissions. The HES focus should be on Ground Transportation and Electric Utilities for the following reasons: ·

- Constrained by reliance on air and marine for tourism and products;
- Technology unlikely to change greatly in marine and air transport sectors; and
- Combined sectors of ground transportation and electricity--69% of Hawaii's greenhouse gases from energy use.

**Ground Transportation.** Between 1990 and 1997, the fuel efficiency of our cars and trucks decreased 7%. Nearly one quarter of all carbon dioxide emissions in Hawaii come from our vehicles. The latest offering from Ford--the Excursion--a 4-ton, V-10, 10 mile per gallon 'sport' utility is currently available at Honolulu Ford dealers. Most trips in Hawaii are made with only the driver aboard. · 100% of our fuel comes from overseas · Average Honolulu resident expends 3% of his

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or her total expenditures on motor fuel · U.S. Energy Information Administration estimates this at \$679 million in 1995--a significant portion leaving the state

There's more to the story. Not only are we clogging our streets and highways, risking our lives, and ruining our environment with automobiles, we're also draining money from the state. Cars coming to market now, like the Toyota Prius and the Honda Insight, are hybrid gasoline/electric vehicles that get up to 70 miles per gallon. And they offer the same comfort and performance of most passenger cars today. Reducing our ground transportation emissions is more than improving fuel efficiency. We need to reconsider our modes of mobility: public transit, car-pooling, telecommuting, and bicycling are better than driving alone. We also need to reduce the amount of driving that we do through smart land use planning. Different forms of transportation also make better use of the limited space we have.

**Electric Utilities.** The HES calls for the construction of new generating capacity on all four major islands in the next 20 years. Most of this electricity will be generated from oil- and coal- fired plants. Hawaii is the only state in the nation that is currently planning to build coal-fired power plants. There will be new generating capacity on every island -- mostly fossil fuel-based; and on Oahu: 605 MW of additional capacity, 70% coal, and 30% diesel

New [fossil fuel] Power Plants Mean: ·

Economic instability;

Money leaving the state;

Hastening climate change; and

Missed opportunities for demand-side management and renewables.

When Hunter Lovins, President of the Rocky Mountain Institute, was asked what new fossil-fuel power plants will mean for Hawaii, she responded, "Pure economic lunacy." When Donald Aitken, Senior Scientist at the Union of Concerned Scientists, was asked the same question, his response was "Economic folly".

The price of oil has been anything but stable over the past thirty years, but the HES uses only the U.S. *Annual Energy Outlook* to predict the price of oil over the next 20 years. The price of oil: ·

- Roller-coaster over the past 30 years;
- *Annual Energy Outlook* should be augmented with rigorous simulation, worst-case analysis;
- Hawaii is highly sensitive to price and supply; and
- Finite resource--inflection in supply all that is needed.

If we want to examine the outcomes of Hawaii's energy strategy in any meaningful way, worst-case scenarios for a doubling--or even quadrupling--of the

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price of oil must be considered. They're not in the HES. And no sensitivity analysis to was performed

Some oil strategists, such as Colin Campbell, believe that we have hit, or are nearing, the apex of oil availability, and we will see the price of oil dramatically rise as supply decreases and demand increases. Oil extraction has outpaced new oil field discoveries, yet we continue to pump oil without acknowledging its finiteness. One theory explaining the seemingly endless reported reserves is this: OPEC countries artificially inflated their "known" reserves in 1986 so that they could enjoy selling a greater quota. We don't need to run out of oil for serious economic disruptions to occur. In fact, because Hawaii's economy is so linked to the price of oil, the slightest shift could create economic chaos.

There are many sound reasons for leaving the carbon-based economy, and running out of oil is only one of them. As Hunter Lovins says, "We didn't leave the Stone Age because we ran out of stones."

It's time for Hawaii to lead. Hawaii has the best opportunities on the planet for demonstrating how clean energy can work. Not only do we have a diverse portfolio to draw upon (wind, solar, ocean energy, biomass, and perhaps geothermal), but we have the strength, location, and impetus to do it. No other U.S. state can boast that, and no other country has the stability, resources, or power.

Why Hawaii? ·

- Most dependent state on oil, relies on imported fuel for over 90% of energy needs;
- 21 degrees latitude;
- Political stability;
- Tethered to superpower;
- Complete portfolio to draw on;
- Developed nation-state; and
- Location to serve developing countries in Asia, Pacific Rim.

And it's our least expensive energy future, most reliable energy future, and best bargaining position for future carbon cutbacks. The bottom line for Hawaii is more money staying in the state economy, a more stable and secure future, and a strong bargaining position when carbon dioxide emissions become restricted.

Currently, money is pouring out of the state to pay for fossil fuels. Over 90% of our energy comes from oil. Smart companies and utilities are beginning to recognize that waste represents inefficiency. Carbon dioxide going out the smokestack is money. · For example:

- \$1 billion LEAVES state on annual fossil fuel expenditures;
- Inefficiencies represent waste: generation and distribution; and



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- Ahead of the curve - Intelligent big oil moving to renewables; and
  - Companies like BP and Amoco are starting to realize that the future isn't in oil--it's in renewables. They've begun to invest heavily in more sustainable technologies.

The current HES is missing opportunities: ·

- Energy savings through aggressive DSM;
- Job creation
- Positioning Hawaii as world leader in sustainable technologies
- Exporter of renewable technology to developing countries; and
- Better environment

By fully embracing renewables as our energy future, we will create local wealth and jobs. Hawaii could be a training ground for developing countries to learn how to produce clean energy. The American Society for an Energy Efficient Economy estimates that over \$500 billion dollars can be saved over the next 20 years in the U.S. if the U.S. exceeds the Kyoto goal.

Our future power plants can be found in our homes and business statewide. An aggressive DSM program would help place solar hot water heaters on homes, efficient chillers in buildings, and super-efficient lighting everywhere. Such measures would likely make projects like the Waahila Ridge powerline unnecessary, and keep money in the economy. We don't do enough DSM. On Kauai, a 26 MW naphtha-fired plant is proposed--but they only started their DSM in February 1998. Only 20% of homes have solar hot water. [Solar] Hot water heaters -- each would displace >1 kW. The 1996 Loudat Report indicated that every \$1 spent on tax credit results in \$1.30 created in Hawaii economy.

Just where does the hot water come from in 80% of homes on the islands?

- Conventional hot water heating: explore for oil--pump oil--pipe oil to supertankers--ship 5000+ miles--refine oil--burn at power plant--heat water to steam--send through turbine--turn generator to produce electricity--regulate electricity-- send current over grid--receive power at home--short circuit electricity in heating element-- heat water--take shower.
- Solar: send water through black pipes on roof--collect in water heater--take shower.

Hawaii doesn't need to venture into uncharted territory when it comes to DSM. In Sacramento (roughly the same population as Oahu), they found 400 MW of energy savings so they wouldn't have to build a replacement for their nuclear reactor. The Sacramento Municipal Utility District (SMUD) shut down an 800 MW nuclear generating station, and replaced that with a program of 400 MW of "conservation power plant" (DSM) and 400 MW of energy alternatives.

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**Renewables.** Engineering economics of smaller sources are less expensive. The future is in decentralized renewables. No longer will we have huge dinosaurs burning fossil fuels and shipping out the electricity (with associated transmission line losses) to geographically scattered customers.

Can we afford this shift to renewables? We can't afford not to. Sacramento is making the shift quickly and easily--without raising everyone's utility rates. Sacramento installed photovoltaics on 450 homes, at utility expense, and then developed a buy-down program to yield another 1,500 PV roofs. SMUD is spending about 3% of its revenue for energy alternatives, 0.7% going to support their massive PV installation program, and rates are not increasing.

With limited land on our islands, the question always comes up, "How do we fit new renewable generating capacity?" Remember, think decentralized; a little here and a little there. The utilities are already figuring this out -- the Sun Power for Schools programs is placing photovoltaics on rooftops. We have a lot of roof space and parking lots to use as "power plants". And wind turbines can share land with other uses such as agriculture. These "power plants" include:

- Decentralized (small scale renewables, Rooftop PV, micro turbines); and
- Wind Power (Uses perhaps 1-3% of land that it actually occupies, Should be used with agriculture).

An essential component to demand side management is smart building. Intelligent design that utilizes daylighting, windows that open, efficient lighting, and smart building materials and floor layout minimize a building's energy load. One of the newest, most creative buildings doing this is in New York City. Why not Honolulu? An example of a smart building is Four Times Square -- Two 200 kW fuel cells in the basement, as well as 15 kW of solar electric glazing on its upper floors. It uses super efficient chillers, lighting, ballasts, and was designed to obviate need for lighting and cooling.

There's more to the story than just economics and the environment. LA's most important driver and justification for the utility's investment in on-site (decentralized) energy generation was to provide safety and reliability, especially in time of crisis. Harmony in St. Johns, which is a resort that is entirely powered by solar energy, was the only resort still functioning after the hurricane.

We need to change the system. Why do we reward the utility for burning more fossil fuel? With guaranteed returns on investment, this is essentially what we are doing. As an alternative:

- PUC should reward utility for cutting customers' bills (Pacific Gas and Electric says will never build another power plant after CA PUC changed); and
- Create third party to run DSM program.

We should follow PG & E's lead and have our PUC reward the utility for cutting their customers' bills through DSM. And if the utility can't seem to be handle this task, it's time to assign it to someone else.

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The utility is stifling progress: ·

- Not supporting net metering;
- Offering incentives to stay on-grid;
- Confusing economics of renewables;
- Disregarding impacts of climate change;
- Cutting DSM programs, and
- Parent Company, HEI, makes coal investments in China and Philippines.

Utilities are in the business of making money for their shareholders. But if government is going to allow a monopoly in Hawaii, we should expect them to act in the public's best interest. But we must call on government leadership and grassroots pressure to create the change we need.

### **Hawaii Energy Strategy 2000**

- Need to do accurate modeling of all outcomes (climate change, oil prices, etc);
- Need to mandate a shift away from carbon economy--meet and exceed Kyoto Protocol;
- Incremental renewable energy growth at 5-year intervals to 100% renewable by 2050; and
- Trend does not represent destiny.

For the HES to have any validity in its recommendations, proper modeling of all outcomes must be performed. A carbon tax must be modeled as a proper revenue neutral tool with money staying in the economy, not as simply more expensive fuel. The impacts of climate change must be quantified and integrated into the model. And uncertainty analysis must be calculated for varying prices of fuels. If we choose, Hawaii can be independent of imported fossil fuels by 2050.

#### **17.2.4      *Comments of Dr. Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu***

Hawaiian Electric Company, Inc. (HECO) has reviewed the draft *Hawaii Energy Strategy 2000 (HES 2000)* report dated November 16, 1999. Again, thank you for the opportunity to participate in the review process of the *HES 2000* report and also the recent workshop on the *HES 2000*. We note that there are many areas where we are in agreement with the recommendations in the *HES 2000* report. The areas of agreement include:

- Encourage early deployment of electric vehicles,
- Identify, designate, and permit sites for future electricity generation consistent with IRPs,
- Continue to pursue greater efficiency in fossil fuel generation,

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- Continue to assess need for renewable energy state income tax credit,
  - Continue to support cost-effective utility DSM programs,
  - Continue to work with USDOE to provide for rule making to implement Strategic Petroleum Reserves priority access sales provisions,
  - Actively promote Hawaii energy and environmental companies (abroad),
  - Conduct RD&D on renewable energy technology using Hawaii's abundant renewable energy resources, and
  - Conduct RD&D on electric system efficiency and clean energy for electricity generation in Hawaii.

However, since the *HES 2000* is intended to be a basic element in the State energy planning and development process, we have serious concerns with other recommendations made in the report. This letter to you provides both general comments and detailed comments explaining our concerns. The detailed comments are presented in the attachments to this letter.

***HES 2000 should be corrected before publishing.*** [Editor's note: Errors of fact brought to our attention by HECO were corrected. Many differences of opinion remained.] As stated in the draft report, the purpose of the *HES 2000* report is "to assist State of Hawaii planners and policymakers, members of the Hawaii energy community, and Hawaii's people to better understand Hawaii's current energy situation." Further, the draft report states that the *HES 2000* "develops and analyzes possible future energy scenarios and suggests a preferred energy future for Hawaii." To achieve this "preferred energy future for Hawaii", the *HES 2000* presents numerous policy recommendations, many of them very specific and many of them with potentially significant impacts on Hawaii. Our concerns stem from the fact that many of the potential impacts have not been fully analyzed. In many cases, misleading, incomplete, out-of-date or inaccurate information was used in the analysis of potential impacts. To achieve the stated purposes of the *HES 2000*, we strongly recommend that these flaws be remedied before the report is published. To do otherwise would be a great disservice to the audiences that the *HES 2000* is intended to serve.

***HES 2000 contains incomplete and misleading information.*** We find in several instances the *HES 2000* selectively presents information to support the policy positions of DBEDT. Regarding forecasting future oil prices in section 3.6, the *HES 2000* provides the U.S. Department of Energy's fuel price forecast and balances it with section 3.6.2.4 which provides a competing view that oil prices will be much higher than forecasted.

However, in other instances, the *HES 2000* is one-sided and misleading. Regarding renewable energy, Chapter 8 contain many recommendations for installing non-cost-effective renewable energy systems for electricity generation in Hawaii. Table 13.4 in Chapter 13 shows the estimated negative impacts to the economy. However, there is little or no discussion of the negative economic impacts of these recommendations. Also, in Section 8.4.2.1, the *HES 2000* down

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plays the utility's concern on the limits to the amount of wind power the utility grid can accept. In fact, the *HES 2000* report presents only a portion of the conclusions from a utility study on allowable wind penetration (see comment 24 in Attachment 2) thereby changing the conclusions.

Regarding Global Warming, there is no mention in the *HES 2000* that many climate experts disagree with the Kyoto Protocol (see attached Congressional testimony of Dr. Fred Singer [provided by HECO] in [their] Attachment 3) or that some scientists who participated in the IPCC report claim that significant, unauthorized alterations were made to the conclusions in the final draft of the report before it was published.

Also, there is also no discussion in the *HES 2000* report of the tradeoffs involved in a policy to reduce Hawaii's greenhouse gas emissions. The *HES 2000* report shows that there will be negative economic impacts for Hawaii and that the associated reductions in greenhouse gas emissions will be nominal, at best. In addition, any state-based program initiated by Hawaii at this time may very well be inconsistent with and pre-empted by a national program.

Regarding electricity competition, the *HES 2000* goes into great detail on the possible benefits of competition in Hawaii based on recent developments occurring on the mainland. The *HES 2000* report recommends electricity competition in Hawaii. However, there is no discussion on whether the perceived benefits of competition would actually occur in Hawaii. The *HES 2000* does list HECO's concerns for the possible negative impacts of electricity competition in Hawaii, but there is no further discussion or explanation on how or even if these negative impacts would be addressed.

Without a complete and balanced analysis of these complex issues, it will be impossible for planners and policy-makers to make informed decisions. The PUC has established a docket to consider all the issues related to electric competition in the state of Hawaii. Given this effort by the PUC, we recommend that recommendations regarding electric competition in Hawaii be deferred to the docket before the PUC.

***HES 2000 focuses on short-term impacts.*** For many of the analyses in the *HES 2000*, short-term impacts appear to be the primary consideration. An example is the assessment of economic risks summarized in Section 2.2.3. These negative, short-term economic impacts are cited repeatedly in *HES 2000* as justification for the increased use of more expensive renewable technologies which will have long-term, negative impacts on electricity prices (i.e. electricity prices will be higher). The frequent focus in the *HES 2000* on the short-term impacts of long-term plans is inconsistent with the perspective provided by Dr. Seiji Naya, Director of DBEDT. In an April 22, 1997, meeting with Dr. Naya, you [Maurice Kaya], Michael May, President of Hawaiian Electric, and other HECO executives, Dr. Naya stated that long-range planning should be undertaken with "normal" conditions in mind.

The difference in long-term vs. short-term impacts is a key difference in planning perspectives and planning analyses. It is interesting to note that *HES 2000*

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acknowledges on page 2-10 that “by investing in alternate energy within the state, expenses may not necessarily be reduced but more of the money spent will remain in the state’s economy and more jobs will be created.” This statement in the *HES 2000* is consistent with the results of an analysis done by the National Economic Research Associates (NERA) consulting firm as part of the HECO IRP-2 planning process. The NERA study showed that, in the long term, increased use of more expensive renewable generation technologies would create more jobs.

However, due to the resulting higher cost of electrical energy from these higher cost renewable technologies, the long term, net economic impacts were negative compared to the base case where the most cost-effective generation technologies were used. This was the case even when an oil price spike was included in the economic analysis. So, even with circumstances most favorable to renewables (i.e., an oil price spike), the long-term economy was better off without renewables than with renewables. Thus, renewable energy policy recommendations based on short-term impacts may not be in the best, long-term interests of the state.

**HECO and DBEDT should work together** Thank you for the opportunity to provide our comments and we would like additional opportunities to work with you in the refinement the *HES 2000* report prior to publication.

#### **Attachment 1 -- HECO’s General Comments on draft Hawaii Energy Strategy 2000 Report**

The following points are general comments on the themes and issues contained in the *HES 2000* report. Specific comments on various sections in the report follow these general comments.

**Electricity Competition.** Electric competition is a complex issue that requires knowledge of the underlying market forces. It is too simplistic to attribute lower electricity prices on the mainland to competition without considering the effect of the deregulation of the natural gas industry and other effects. The *HES 2000*, in recommending the restructuring of the Hawaii electric industry, does not consider whether competition is feasible in Hawaii, the possible negative impacts from competition and the implications for the people and economy of Hawaii. Since the start of electric competition on the mainland, there have been instances of spikes in electricity prices of several thousands of dollars per MWh during generation shortages caused by heat waves.

In addition, the *HES 2000* does not address how competition will address some of the reasons for higher electricity prices in Hawaii mentioned in section 7.2.2.2 of the *HES 2000*. The PUC has established a docket to consider all the issues related to electric competition in the state of Hawaii. Given this effort by the PUC, we recommend that recommendations regarding electric competition in Hawaii be deferred to the docket before the PUC.

**Renewable Energy Technologies.** The *HES 2000* report recommends considering implementing scenario E2 (maximize renewable energy in the electricity sector). There is very little discussion of the potential negative impacts that scenario E2 would have on the state economy even though there are tables

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and charts in the *HES 2000* that depict such impacts on the state economy. Furthermore, the recommendations to consider the non-cost-effective renewable energy resources contradicts other sections in the *HES 2000* that indicate higher electricity prices are detrimental to the Hawaii economy and that steps need to be taken to reduce the cost of electricity in Hawaii.

**Global Warming.** The *HES 2000* report has a predominant and seemingly overriding focus on the global warming issue. While this issue has received increased media attention, there are additional issues that need to be considered such as impact to the state economy and the implication of such impacts on the people of Hawaii, impact on energy consumers (both residential and commercial), and system reliability. Any recommendations concerning Hawaii's energy future should be based on a more balanced view of energy and should not be focused on global warming.

Setting specific goals at the state level for reducing greenhouse gas emissions is premature. At this time, the nations of the world have yet to reach agreement on the appropriate goals and strategies for dealing with climate change. There are still major unresolved issues such as the participation of developing countries and greenhouse gas accounting mechanisms. Hawaii's efforts should be coordinated with the rest of the nation and the world.

Please note that HECO is not advocating that the global warming issue be discounted or ignored. As you know, HECO has made voluntary commitments in its Climate Challenge Program in which, among other activities, HECO continuously aims to improve system generation efficiency thereby reducing greenhouse gas emissions. In addition, HECO plans to continue its demand-side management programs and renewable energy activities. HECO is simply urging DBEDT to present a balanced view of the issue so that planners and policy-makers can make an informed decision.

**Oil Prices.** Throughout the report there is speculation on many possible events that could increase oil prices, but the report makes no attempt to assess how likely they are to happen. For example, in section 3.7 on page 3-27, the 2<sup>nd</sup> to the last paragraph states that, "Should oil prices rise sharply...", but what is the chance of this happening? What is the chance of oil prices staying the same or declining?

**Other Concerns.** Many of the recommendations contained in the *HES 2000* could have significant impacts to the consumers of energy in Hawaii. However, only one recommendation, that which deals with fuel substitution between gas and electric utilities, suggests involvement of the State's Consumer Advocate. Recommendations dealing with consumers, especially increasing renewable energy and electricity competition should also identify the State's Consumer Advocate as one of the lead organizations.

During the *HES 2000* public workshop, ocean-water cooling for air conditioning was mentioned to be cost-effective for hotels in Waikiki area. Please note that it is our understanding that ocean-water cooling is not cost-effective because it would require a pipeline extending more than two miles out to sea to obtain sea water of sufficient cold temperature. Also, the associated potential environmental impacts

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and public opposition to shoreline construction in Waikiki would be significant factors in the viability of such a project.

[Editor's Note: Attachment 2 was the Testimony of Dr. S. Fred Singer, President, Science & Environmental Policy Project to the Committee on Small Business, U.S. House of Representatives, on July 27, 1998. It is not reproduced here. It is available on the Internet at <http://www.sepp.org/glwarm/testimony.html>

Attachment 3 contained detailed comments. Where HECO's suggestions were not included in the report, they are referenced below by Chapter.]

**17.2.4      *Comment by Dr. Bruce S. Plasch, Decision Analysts Hawaii, Inc., Honolulu***

Excellent report and workshop.

**17.2.5      *Comments by John Shin, AES Hawaii, Kapolei***

AES Hawaii, Inc. is the single largest supplier of electricity to Hawaiian Electric Company. The only coal-fired plant on Oahu is capable of supplying more than 180 megawatts of electricity, about 20 percent of Oahu's electricity needs. The plant also produces 30,000 pounds of steam per hour for the Chevron oil refinery in Campbell Industrial Park.

AES Hawaii, Inc. began commercial operations in September 1992. The plant uses state-of-the art clean coal technology called Circulating Fluidized Bed (CFB) that makes the plant one of the cleanest in the world. AES Hawaii also uses post-combustion technology to further reduce pollutant levels to well below EPA standards.

AES Hawaii is a subsidiary of the AES Corporation, founded in 1981, which is the world's largest global power company. The Company is dedicated to supplying safe, clean, reliable electricity to meet global energy needs. AES generates and distributes electricity and is also a retail marketer of heat and electricity.

AES owns or has an interest in one hundred and eleven plants totaling over 40,000 megawatts in 16 countries. AES also distributes electricity in 6 countries through 14 distribution businesses. In addition to having assets in excess of \$10 billion, the Company has numerous projects in construction or late stages of development.

AES has placed more than \$8 billion of financing with commercial banks, export credit agencies, multilateral financial institutions and public markets. The Company employs roughly 40,000 people around the world. [Editor's Note: A table depicting AES growth was provided, but is not reproduced here.]

**Meeting the State's Energy Objectives:** There were three main objectives identified for the workshop. AES Hawaii appreciates the opportunity to provide the following comments and ideas.

Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;



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The CFB coal-fired plant, since starting operation in 1992, has proven to be highly efficient and reliable. It has an availability of almost 98 percent over the life of the plant, compared to about 88 percent industry average.

Since much of the infrastructure is already in place, new capacity can be added for 4-6 cents/kWh, comparable to the cost of new capacity for coal on the mainland. This is a significant advantage over new capacity for oil, which is 7-11 cents/kWh.

The emission of criteria air pollutants from the CFB coal-fired plant is well below the applicable Ambient Air Quality Standards, and lowest of the major generating plants on Oahu. A new coal-fired plant will have lower emissions overall than a comparable oil-fired plant. To offset all carbon dioxide emitted from the facility, AES Hawaii fully funded a program to preserve 143,000 acres of rain forest in Paraguay. AES will consider similar programs for carbon offset for new capacity that is brought online by us in Hawaii.

Increased energy self-sufficiency where the ratio of indigenous to imported energy is increased; AES, although mainly reliant on imported coal, uses technology that enables burning of locally produced fuel sources and waste products. AES already burns over 1% in alternate fuels such as shredded tires (TDF) and spent activated carbon from the Board of Water Supply. Fuel sources that would otherwise would be wasted and expensively transported out of state for disposal. AES is also capable of burning waste oil, other wastes and by-products, and renewable fuel sources from agriculture to alleviate the growing disposal problems that these wastes cause, as well as supplementing coal with renewable energy sources. It's possible to replace significant amount of oil used on Oahu by using these waste or renewable fuel sources through the CFB boilers.

By being able to burn these wastes in a controlled process, the environmental damages that these wastes cause are largely mitigated. A CFB coal-fired plant has this technological advantage over an oil-fired plant.

Presently, the financial cost to the State and the consumers, of properly disposing of these wastes, is tremendous. AES Hawaii is the only electricity generator in the State that is properly permitted and has the necessary technology and capacity to handle all these waste products in an environmentally sound manner.

Greater energy security in the face of threats to Hawaii's energy supplies and systems; AES Hawaii is the only electricity generator on Oahu that uses coal. As such, AES offers the only large-scale alternative to dependence on imported oil. High quality coal, such as the one AES uses, is readily available from many worldwide sources. The price of coal is much lower than oil and also much more stable. Additionally, by being able to use locally generated wastes and locally produced renewable energy sources, dependence on imported fuel will be reduced.

By planning new capacity using coal-fired technology, further reduction of the State's dependence on oil can be achieved. The cost of new electricity generation will be lower, not just because of the lower price of coal, but also because of the

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reduced volatility of the fuel price. The consumers and businesses will see a lower and more stable cost on their electricity bill, thus promoting economic growth.

#### **17.2.6        Comments by Cliff Slater, Honolulu, Hawaii**

Attached is a recent *Honolulu Advertiser* column I wrote on “global warming.” Please consider this letter and the column as my comments on the *Energy Strategy 2000* draft.

First, the underlying premise of the Energy Strategy 2000 draft that global warming is a real threat to our way of life. My column on global warming, and its accompanying footnotes, shows there is no agreement among our leading scientists that such is the case. Until there is some consensus among them on the global warming issue, the State of Hawaii should take no action that would negatively impact our already weak economy.

Second, the comments on oil use have no place in a serious document about energy use. They are reminiscent of the forecasts of impending doom from the World Watch Institute and others who have warned of imminent shortages since the 1970s. Such warnings have been around since the U.S. Geological Survey started warning about potential oil shortfalls in the 1890s.

The facts are that:

- The price of oil, in real terms, is not much higher than before the 1970s.
- Total world oil consumption is hardly more than it was 20 years ago.
- The world’s proven reserves are higher than they have ever been.

Mr. Slater included a copy of his “Second Opinion” column article, entitled “Much ado about hot air” which appeared in the *Honolulu Advertiser* on October 14, 1999. It is available on the Internet at: <http://www.lava.net/cslater/warmingf.htm>.

#### **17.2.7        Comments by Gabriela Taylor, Citizens for Clean Air, Kauai**

I was impressed with the scope of information that was covered in the conference day. It was a thorough coverage of the topics. All the presenters were excellent. The discussion was not adequate, however.

My feeling is that there needs to be more of a dedication to the critical issues by DBEDT. The energy consumption situation is urgent in Hawaii and the IRP is the guiding force. In my opinion, DBEDT is far too casual in their regulation of the energy distributions systems. If DBEDT does indeed see the impending doom of continuing on the same course with the indiscriminant burning of fossil fuels in our automobiles and electric power plants, namely the contribution to global warming and devastating climatic changes, then DBEDT needs to become more aggressive in their regulatory function. [Editor’s Note: DBEDT has no regulatory functions in energy.]

It was startling to learn that DBEDT does not consider the further contamination of the air we breathe by contaminants from diesel fuel power plants as a public

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health hazard (Steven Alber). [Editor's Note. No such statement was made in conference. In a separate discussion of the Kauai Power Partners project, Mr. Alber indicated that the emissions from the proposed plant would be within limits specified by EPA and State of Hawaii Department of Health regulations.] I believe that air contaminated to a significant (terminology used in the EIS [Environmental Impact Statement] by KE in regards to their proposed diesel fuel power plant) level by nitrous oxides, sulfur dioxides, and particulate matter should be a concern. Health [problems] such as lung disease are a cost that needs to be fit into the equation of costs when new projects are being considered. We have pristine air on the Island of Kauai (except by the Port Allen power plant) and any large increase (even below the EPA standards) is an unacceptable price to pay for "cheap, but dirty" power.

Hawaii is one of the few places in the USA where we have all three of the sustainable energy sources: water, sun, and wind. The improved technologies for these sustainable sources, plus fuel cells are making it possible for new directions in power production (using distributed energy systems). Diesel power plants are not being built in most states on the Mainland. Why are we saddled with outdated energy solutions? DBEDT needs to get some current statistics for the cost of these alternatives. The figures in the IRP are outdated. It is your job to supply current data for evaluation and comparison purposes.

In addition, it is your role to assist in the passage of bills in the Legislature regarding net metering and wheeling to go along with deregulation.

My recommendation is for you to put some teeth into your regulations and use the power you have to back up the evidence.

The people of Hawaii are entrusting you with their future. You have the opportunity to guide use into a clean and sustainable 21<sup>st</sup> Century.

### **17.3 Specific Comments Referenced by Chapters in the Report**

The following comments are organized by referenced chapter. Only those chapters receiving comments are listed.

#### **17.3.1 Chapter 1 State Energy Policy and Hawaii Energy Strategy 2000**

- Besides proposing a new State energy objective related to climate change to the 2000 Hawaii State Legislature, the State of Hawaii government should mandate a (say) 20% reduction (relative to 1990) of its own energy use in a manner similar to the Federal government's own mandate of 30% [reduction] by year 2010. (**Dr. Ray Carr, Energy Coordinator, County of Hawaii, Hilo**)
- As the basic element of the planning and development process for DBEDT and the State, *HES 2000* should provide a comprehensive, unbiased, and balanced view of energy as it relates to business, economic development, and tourism in the State. This is necessary to (1) increase the understanding of Hawaii's energy situation, and (2) produce

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recommendations to achieve State energy objectives. However, the predominant focus of *HES 2000* seems to be on climate change which is only one consideration of many in the planning and development process, and only one aspect of Hawaii's energy situation and energy objectives.

**(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**

- **Reference Section 1.2.** Including “reduce greenhouse gas emissions from energy supply and use” as an objective for the HES is premature at this time. While climate change is an important issue for Hawaii, the focus on climate change in *HES 2000* is inappropriate and inconsistent with the *HCCAP* recommendations for goal setting. The *HCCAP* recommendation is to “develop consensus as to Hawaii's goals for greenhouse gas emission reductions.” (*HCCAP* section 1.1.3 and section 5.1). As stated, the *HCCAP* recommendation does not support inclusion of an additional objective in the HES to reduce greenhouse gas emissions at this time.

The position that Hawaii can and should play a role in reducing its greenhouse gas emissions that contribute to climate change is fundamental to most if not all recommendations in the HES report. However, this position is premature. The implementation of the Kyoto Protocol is still the subject of debate at international levels. Hawaii should first allow the goals and strategies for dealing with the global issue to be established at the national level, and then Hawaii should determine how it could cost-effectively participate. For Hawaii to act prior to and independently of a national strategy is premature and possibly counter-productive, as the state economy may be unnecessarily damaged. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**

### **17.3.2 Chapter 2 Energy, the Economy, and the Environment**

- **Reference: Section 2.2.1.** The statement, “Hawaii's own renewable resources are not fully used . . .” requires additional clarification to put it in the proper context. Using renewable resources requires land, which may be used for other “better” purposes. There are many competing uses for land in Hawaii because land is a very limited resource. From a business and economic viewpoint, although the “renewable resource” opportunity might be foregone, the alternative use might be the “better” use of the land resource.

*HES 2000* states that studies have found that energy efficiency and renewable energy result in more jobs, higher personal income, and marginally higher economic output than the fossil fuel base case. It should also state that other studies show that the higher cost of electricity from renewable energy would result in net, negative long-term impacts to economy. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**

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- **Reference: Section 2.3.1.** Are these [oil spill] impact studies up to date? The recent, 1998 Tesoro single point mooring oil spill demonstrated that currents may not be as predictable as experts once thought. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**
  - **Reference: Section 2.3.2.** *HES 2000* states that “about twice as much fuel is used for transportation than for electricity generation.” Yet, DBEDT’s primary focus is on the utility sector and not transportation. The *HES 2000* should focus additional effort on the energy use in the transportation sector. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**
  - **Reference: Section 2.3.4.** When land use related to transportation is discussed, the focus is on the need to transport and store the fuel consumed by electric power facilities. Airports, roadways, parking facilities, and harbors are examples of transportation-related land use that would exist without the need to transport and store fuel for electric power facilities. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**
  - **Reference: Section 2.3.5.** In regards the IPCC report, *HES 2000* does not provide balancing information, i.e., that there are credible critics to the IPCC report. See attached Congressional testimony of Dr. Fred Singer [see synopsis above]. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**
  - **Reference: Section 2.3.5.5.** **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**

### **17.2.3 Chapter 3 Meeting Hawaii’s Energy Needs**

- The strategy of Hawaii energy self-sufficiency must be based on sustainable development. We should set a firm schedule to meet this objective of self-sufficiency.

Looking at the \$1 billion expenditure for oil imports, we should set a reduction target and schedule to achieve that objective. Looking back at the 1973 energy crisis today, can we feel comfortable not cutting back a big percentage of oil imports? **(Dr. Yu-Si Fok, Professor, University of Hawaii at Manoa, Department of Civil Engineering)**

- **Reference 3.6.2.4.** It should be noted that Campbell is one of a few experts who believe that oil supplies will be declining in the near future. His opinion and the article that is cited need to be taken in the context of other expert assessments on oil supplies (e.g. the Scientific American special report published in March 1998) which balanced the view of declining oil supplies with the view that new technologies and

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unconventional oil supplies will be able to meet future demands. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**

- **Reference Section 3.7.** That price shocks may or may not damage the economy is conjecture. The impact may be a function of the sustainability of high prices. There is a need to balance the possibility of oil price shock with the certainty of higher electricity prices from renewables.

The statement that, "...energy companies have not sought to insure future supply through greater reliance on renewable resources" conflicts with DBEDT's concerns that "Hawaii's average electric revenues are the highest in the nation", and that "high electric revenues tend to reduce employment". **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**

- Recommendation: Use the Environmental Impact Statement process to identify energy needs for a project. Identify a measurement to compare energy usage to other similar activities.

Develop energy-use guidelines for new/rebuilt projects. Develop a matrix with positive and negative factors highlighted for each proposed project. Make a big deal about energy usage so developers know that energy needs are an important criteria for projects. ). **(Anonymous HES 2000 Workshop Attendee)**

- Energy needs:
  - To change peoples' consumption of energy (adopt California Air Resource Board energy efficiency rules).
  - More needs to be done to educate or force a reduction (through disincentives) of energy consumption.
  - Use "Environmental Ethic" to demonstrate that personal actions can save energy and have environmental impact (Take Hawaii Fun Fueled Activities Book to school – make it part of curriculum).
  - Promote recycling activities/tax waste (product life cycle considerations). Government specifications for recycled product use in public works. **(Anonymous HES 2000 Workshop Attendee)**

#### **17.3.4 Chapter 4 Energy for Ground Transportation**

- The biggest advance in ground transportation efficiency in many years is the hybrid vehicle. We need to stimulate their adoption in Hawaii as much as possible through public policies and/or legislation since these vehicles do not have a champion. **(Dr. Ray Carr, Energy Coordinator, County of Hawaii, Hilo)**
- I would recommend that the State encourage the use of electric cars or other low emission vehicles by making it easier for consumers to purchase

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such. Right now, and for the foreseeable future, an individual has no means to easily buy such a vehicle. If consumers have to go to great lengths to simply find a low emission vehicle they will not buy one. I know, I tried to find one, could not and ultimately bought a conventional gas burner.

The State should require that auto dealers and suppliers to provide such vehicles to their customers. Another option is to require the auto rental companies to provide electric cars to travelers. What better way to impress our visitors about our seriousness about keeping our paradise clean? If fleet vehicles are the only means to introduce low emission vehicles, rental cars may be a viable way to do so. However, the only way to get the vast amount of personal vehicle users to use alternatives, the alternatives must be easily accessible. **(Dan Nugent)**

- Need incentives to encourage purchase and use of hybrid gas/electric vehicles, which require no new infrastructure to support, yet are two to three times as efficient as gasoline engine vehicles without the range limitations of all-electric vehicles. The Toyota Prius is expected to be in major markets by summer 2000. **(Bill Nutting, Marine Corps Base Hawaii Facilities Department)**
- Poor land use planning. No long-range surface transportation planning that [includes] mass transit as opposed to road building. **(Jon Olson, Big Island Rainforest Action Network, Pahoa, Hawaii)**
- Continue efforts to increase ridesharing and use of mass transit to reduce energy use. **(Dr. Bruce Plasch, Decision Analysts Hawaii, Inc.)**
- Provide incentives for getting people out of their cars.  
Eliminate/minimize “all day” parking in urban areas.  
Price employee and government employee parking lots fairly to promote public transportation.  
Provide incentives for people to select smaller, more efficient cars (use California Air Resources Board rules).  
Partner to build public transit system (set goal of system to come on line as soon as possible).  
Build free car parks in areas to use public transit.  
Incentives for bike users and create SAFE bikeways.  
Build SAFE walkways in suburban areas.  
Minimize new road building projects (Shift funds to public transit and bike and walkways). **(Anonymous HES 2000 Workshop Attendee)**
- Suggest that state support “pay-at-the-pump” basic car insurance. Recognizing that this would increase the cost for each gallon of gas, it would have the following benefits:
  - Promote use of more energy efficient cars;
  - Promote use of mass transportation;
  - Promote car pooling;

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- Provide basic auto insurance for everyone; and
  - No net increase in cost for those who have car insurance.

**(Anonymous HES 2000 Workshop Attendee)**

- Presenting carbon and other pollutants on a per mile traveled basis for each fuel and alternative fuel would be a good educational tool. This emission estimate must be presented on a life cycle basis, not just combustion alone. For example: Electric car emissions associated with fuel, power plant emissions, transportation of fuel; photovoltaics – emissions associated with mining materials. Comparable numbers to help inform the decision maker. **(Anonymous HES 2000 Workshop Attendee)**

### **17.3.5 Chapter 7 Generating Electricity for Hawaii**

- **Reference 7.2.2.2.** The following paragraph should be inserted:

“Inflation also contributes to higher costs, however, rate increases do not simply track the current rate of inflation. As the PUC has recognized in prior rate cases, the need for rate increases can be caused by current inflation, which causes expenses to increase faster than revenues, or by the addition of substantial capital projects. During periods when substantial capital additions are taking place, past inflation causes new plant additions and replacements to cost substantially more per unit of capacity than the depreciated original cost for an equivalent existing unit of capacity. Rate increases are needed as current or incremental costs rise above average and imbedded costs on a per-unit basis, and with electric rates fixed on a per-unit basis.” **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**
- **Reference 7.2.2.3.** “The effect of differences in electricity cost between the Mainland and Hawaii also requires consideration of the differences in electricity usage intensity”. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**
- **Reference 7.2.2.4.** “Delete this section. Currently, the PUC reviews utility revenue requirements in comprehensive rate case proceedings. That is the proper forum for this review, and the Consumer Advocate has the responsibility to review the reasonableness of the utility’s requested revenue requirement. Having the PUC conduct additional reviews would result in additional cost, without additional benefit”. **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**
- **Reference 7.11.2.3.** The utilities testified against Distributed Power and Net Metering. The lead agency should be those entities that support distributed power. **(Henry Curtis, Executive Director, Life of the Land, Honolulu)**



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- “Add ‘Community’ to Chapter 7 lead organization’s chart”. (Jon Olson, Big Island Rainforest Action Network, Pahoa, Hawaii)

#### **17.2.6 Chapter 8 Increasing Renewable Energy Use in Hawaii**

- Renewable energy [technologies] were identified many years ago. They are not used due to “high cost”!! Why do we just look at the tangible high cost and not consider the low intangible cost of using them? (We have to use the complete cost analysis of tangible and intangible costs to arrive at our conclusion.) Intangible costs [benefits, in this case] are mostly from environmental cost accounting. Government cannot avoid using them to justify our budget. (Dr. Yu-Si Fok, Professor, University of Hawaii at Manoa, Department of Civil Engineering)
- **Reference 8.4.2.2., 8.4.3.2, 8.4.4.2, and 8.4.5.2** Let’s mandate photovoltaic cells and net metering for all buildings built with tax credits. (Henry Curtis, Executive Director, Life of the Land, Honolulu)
- **Reference 8.4.2.2.** Is a dedicated biomass-to-electricity facility reasonable for Oahu? There is no dedicated biomass-to-electricity facility in operation in the U.S. All biomass operations in the U.S. use biomass waste products. *HES 2000* should recommend how biomass can fit into the energy mix. (Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)
- **Reference 8.5.1.1.** If accurate cost data is not available now from the electric utilities, why ask them for accurate cost data in the future? It is clear that our utilities like high prices, they oppose competition. DBED should also find the true cost of oil, so we can make a true assessment of the relative cost of fossil fuel versus photovoltaics. Finally, just as photovoltaics should include generation and storage, fossil fuel costs should include generation and transmission. (Henry Curtis, Executive Director, Life of the Land, Honolulu)
- **Reference Sections 8.5.3.2 and 8.5.3.3.** NREL lists specific strategies, which include system benefit charges and renewable energy portfolio standards. The *HES 2000* recommendation to implement the NREL strategies of the renewable resource docket contradicts other sections of *HES 2000*, which seek reductions in electricity cost.

A system benefit charge is a tax or user fee to the electric customers. This adds cost to the utility which will be reflected in the electricity rates. *HES 2000* reports that high electricity revenues reduce economic performance and cost jobs. This is not consistent with sound economic policy in the State.

HECO’s own experience and the experience of other companies currently installing renewable energy resources indicate that the cost estimates and

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assessments of commercial availability of most renewable resources are highly optimistic and unsupported. In time, some of these renewable energy technologies may become cost-effective and commercially available. Mandating renewable energy portfolio standard requirements would be arbitrary and would not provide the best cost options to the customers. Renewable energy portfolio standards would be analogous to agreeing to buy something without knowing the price of either what is being purchased or the alternatives. Is this the kind of policy that is good for sound, economic development in the State? **(Dr Brenner Munger, Manager, Power Supply Planning and Engineering, Hawaiian Electric Company, Inc., Honolulu)**

- **Reference 8.5.3.3.** Let's have 50% renewables by 2020. Those who immediately say "can't be done" are not included as lead agencies. Everyone who has read the recommendation "Consider implementing a Renewable Energy Portfolio Standard, Public Benefit Charge, or Green Pricing" has considered it. Now let's do it. **(Henry Curtis, Executive Director, Life of the Land, Honolulu)**
- We do not view geothermal as successful. H<sub>2</sub>S (hydrogen sulfide) leaks/pentane loss of nearly 50,000 gallons per year. Use of caustic soda to abate air emissions and that impact. Social impact to surrounding community of loss of land value; noise as an impact. **(Jon Olson, Big Island Rainforest Action Network, Pahoa, Hawaii)**

### **17.3.7 Chapter 11 Increasing Energy Efficiency in Hawaii's Buildings**

To improve energy use efficiency:

- Phase out low-efficiency hardware (similar to phase out of 5-gallon tank toilets.
- Promote automatic turn-off switches. (If there is enough sunlight, street lights, office lights, and others will be turned off automatically.
- If the state can cut its budget at 4-4-4, why can't our electricity be cut 4-4-4?

**(Dr. Yu-Si Fok, Professor, University of Hawaii at Manoa, Department of Civil Engineering)**